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Attorney's Docket: 2000DE402D
Serial No.: 10/668,005
Art Unit 1714
Response to Office Action Mailed 09/11/2006

REMARKS

The Office Action mailed March 27, 2006 has been carefully considered together with each of the references cited therein. The amendments and remarks presented herein are believed to be fully responsive to the Office Action. Accordingly, reconsideration of the present Application in view of the following remarks is respectfully requested.

Applicant has amended the claims to attend to housekeeping matters and to more clearly describe the invention. In claim 1, Applicant has replaced the 5 – 95% ranges of components A and B with a range of 20 – 80%; replaced the formulae 1 and 2 with a list of amphiphiles selected from the group consisting of glyceryl monooleate, oleic acid diethanolamide, oleic acid, tall oil fatty acid, polyisobutenylsuccinic anhydride diesterified with diethylene glycol, and $C_{18}H_{35}-O-CH_2-CH(OH)-CH_2OH$; and replaced description of the structural units of the terpolymer B with a list of vinyl esters selected from the group consisting of neononanoic, neodecanoic, neoundecanoic acid, neododecanoic acid, and mixtures thereof. Support for this amendment may be found in Applicant's Specification on page 4 at lines 27/28, the amphiphiles listed on page 39 and exemplified on pages 42-45, and originally filed claims 1 and 7. It is believed that no new matter has been introduced by this amendment.

Claims 1-4, 6, 7, 9, and 11 were rejected under 35 U.S.C. 103(a) as being unpatentable over CA 2,242,474 in view of EP 680 506. The Canadian reference '474 broadly discloses a flow improver (having 65 to 94 mol-% ethylene, 1-25 mol-% neocarboxylic acid and 5-35 mol-% vinyl acetate) which is not identical to Applicant's terpolymer wherein Applicant's terpolymer has 3 to 18 mol-% of a short chain vinyl ester and from 0.5 to 10 mol-% of neocarboxylic acid vinyl ester. The EP 680506 reference is a broad general reference which states that lubricity additives may be used with any type of additive, but the '506 reference is silent on any impact of such a combination on filterability or lubricity. The examiner argues that it would be obvious to one skilled in the art to include the lubricity additive in the fuel composition because the Canadian reference suggests the need for a lubricity additive. Applicant discovered that it was critical to the instant invention as described at page 3, lines 10-19 of Applicant's Specification that under cold blending conditions with low-sulfur, highly paraffinic oils, that using a conventional fuel oil additive resulted in filtration problems and lubricity problems. Only Applicant's additive comprising 20:80 to 80:20 percent combination of the particular amphiphilic component A) as now recited in amended claim 1 and the particular cold flow improver, terpolymer B) as recited in

Attorney's Docket: 2000DE402DSerial No.: 10/668,005Art Unit 1714Response to Office Action Mailed 09/11/2006

amended claim 1, overcomes these problems. As shown in Tables 3-7 of Applicant's Specification, cold flow improver Polymers B-G (ethylene/vinyl acetate/vinyl neodecanate and ethylene/vinyl acetate/ vinyl neododecanate) of the present invention, which contained an ethylene content of from about 85 to 90 mol-%, a vinyl ester content of from about 4 to 13 mol-% of vinyl ester, and a neoester content of from 2 to 6 mole percent unexpectedly did not impact the lubricity, as measured by the WSD, wear scar diameter, compared to conventional cold flow improvers without the neoester content, as exemplified by Polymer A which did impact the lubricity in combinations with a range of oil-soluble amphiphilic compounds 1-6, which included glyceryl monooleate, polyisobutene succinic anhydride diesterified with diethylene glycol, oleic acid diethanolamide, $C_{18}H_{35}-O-CH_2-CH(OH)-CH_2OH$, oleic acid, and tall oil fatty acid. Furthermore, in Applicant's Specification, at page 37, lines 4-11, Applicant presents the British Rail parameter, ADT, for determining the filterability of a fuel oil under cold blending conditions. A fuel oil having a value greater than 25 is not considered filterable. Referring to Tables 3-7 of Applicant's Specification, those fuel oils treated with the cold flow improver containing Polymers B-G of the present invention, which contained an ethylene content of from about 85 to 90 mol-%, a vinyl ester content of from about 4 to 13 mol-% of vinyl ester, and a neoester unexpectedly showed significantly improved (almost 6 times improved) filterability (ADT) over the comparative Polymer A which did not contain any neoester, and specifically none of Applicant's claimed compounds. Still further, attached to this response is a Declaration submitted by Dr. Matthias Krull, one of the named inventors of the subject application, under 37 C.F.R. 1.132 which presents additional data comparing test results in 2 low sulfur test oils 6 and 7. A comparison of the improvement in the cold flow properties of the two highly paraffinic, low sulfur test oils by the addition of additives of the invention based on combinations of the following:

Amphiphile 1 (glycerol monooleate) as described in the original application.

Amphiphile 6 (tall oil fatty acid) as described in the original application.

Polymer A (ethylene-vinyl acetate copolymer, Comparison), as described in the original application.

Polymer F (terpolymer containing 85.2 mol-% ethylene, 10.4 mol-% vinyl acetate and 4.4 mol-% vinyl neodecanoate; melt viscosity V_{140} of 165 mPas)

Polymer G (terpolymer containing 87.0 mol-% ethylene, 9.4 mol-% vinyl acetate and 3.6 mol-% vinyl neoundecanoate; melt viscosity V_{140} of 151 mPas)

Polymer H (terpolymer containing 83.3 mol-% ethylene, 11.4 mol-% vinyl acetate and 6.3 mol-% vinyl neononanoate; melt viscosity V_{140} of 187 mPas)

Attorney's Docket: 2000DE402D

Serial No.: 10/668,005

Art Unit: 1714

Response to Office Action Mailed 09/11/2006

Comparisons based on combinations of the above amphiphiles 1 and 6 and the cold flow improvers (Polymers F, G, and H) are shown relative to the improvement in cold flow properties to the addition of a cold flow improver consisting of an ethylene vinyl acetate copolymer. In the comparisons, the range of amphiphile and the range of the neoester-based CFI are shown over a range of 22 to 86%, wherein the additive consisted of a mixture of an amphiphile and a cold flow improver (CFI) such as Polymer F, and the resulting impact on CFPP (Cold Filter Plugging Point) and ADT (filterability parameter) and WSD (coefficient of friction and wear scar) were determined. The results of the additional comparison testing are shown in Tables A and B, copies of which are attached to this paper. As shown by these new experiments and the examples presented in the subject Application, the combination of an amphiphile A) such as glycerol monooleate, oleic acid diethanolamide, oleic acid, tall oil fatty acid, polyisobutenylsuccinic anhydride diesterified with diethylene glycol, and $C_{18}-H_{35}-O-CH_2-CH(OH)-CH_2OH$, and a cold flow improver B) being a terpolymer comprising ethylene, vinyl acetate and vinyl esters of neocarboxylic acids - particularly neononanoate, neodecanoate, neoundecanoate, or neododecanoate, when the mixing ratio of component A) and B) is between 80 : 20 and 20 : 80, surprisingly provided significantly better filterability than similar combinations of amphiphiles with ethylene copolymers without such vinyl esters of neocarboxylic acids. Nowhere in the Canadian reference, or the combination of the broad disclosure of the cold flow improvers of the Canadian reference and EP-0680506 which discloses ester lubricity additives is the specific combination claimed by the Applicant disclosed. Furthermore, no one skilled in the art, armed with the broad disclosures of either the Canadian reference or the EP reference would be motivated to arrive at applicant's invention. Obvious to try is not the standard of 35 U.S.C. §103. The prior art references must be read as a whole. No one skilled in the art would be able to combine any of the teachings of the reference to render the instant invention obvious without the improper use of hindsight. The teachings are to be viewed as they would have been viewed by one of ordinary skill. It is impermissible within the framework of 103 to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary for the full appreciation of what the reference fairly suggests to one skilled in the art. The reference suggests that the additives improve fuel properties; however, the reference fails to suggest that there are significant differences in performance between some compositional ranges of a specific cold flow additive when combined with a particular lubricity additive when employed in cold blending conditions in low sulfur fuel oils. No one skilled in the art armed with either the Canadian reference or the

Attorney's Docket: 2000DE402DSerial No.: 10/668,005Art Unit 1714Response to Office Action Mailed 09/11/2006

EP reference would be motivated to select Applicant's particular compounds from the thousands of structures represented by the Canadian and/or EP disclosures. The data provided by the Applicant clearly shows significant cold flow and lubricity advantages to the instant claimed invention. Proceeding contrary to accepted wisdom is strong evidence of unobviousness. Therefore, the rejection of claim 1 as amended under 36 U.S.C. 103(a) as being unpatentable over CA 2,242,474 in view of EP 680 506 should be withdrawn for the reason that the Canadian reference does not disclose the specific combination of Applicant's component B with the lubricity improver component A which as an additive surprisingly improves the cold flow properties of fuel oils without adversely impacting the lubricity of the fuel oil or its filterability. The rejection of claims 2-4, 6, 7, 9 and 11 under 36 U.S.C. §103(a) as being unpatentable over CA 2,242,474 in view of EP 680 506 should be withdrawn for the reasons given in support of claim 1, from which they depend.

Claim 8 was rejected under 35 U.S.C. 103(a) as being unpatentable over CA 2,242,474 in view of EP 680 506 as applied to claims 1-4, 6, 7, 9, and 11, and further in view of Davies (US 6,101,545). The rejection of claim 8 under 35 U.S.C. 103(a) as being unpatentable over CA 2,242,474 in view of EP 680 506 as applied to claims 1-4, 6, 7, 9, and 11, and further in view of Davies (US 6,101,545) should be withdrawn for the reasons given in support of claim 1 above, from which claim 8 depends, and for the reason that the '545 Patent does not teach or suggest the particular combination of Applicant's amphiphile, component A, with the specific terpolymer, component B, as claimed in Applicant's amended claim 1.

Claims 1-9 and 11 were rejected on the of non-statutory obviousness-type double patenting as being unpatentable over claims 1-9 of U.S. Patent No. 6,652,610. Applicant has herewith provided a Terminal Disclaimer which disclaims the terminal portion of the statutory term of any patent granted on the instant invention which would extend beyond the expiration date of the full statutory term of US Patent 6,652,610, which is commonly owned and the extent of which is the whole of this invention. Therefore the provisional rejection of Claims 1-9 and 11 under the judicially created doctrine of double patenting over the claims of US Patent 6,652,610 should be withdrawn.

Accordingly, favorable reconsideration and an allowance of all pending claims are courteously solicited.

Attorney's Docket: 2000DE402D

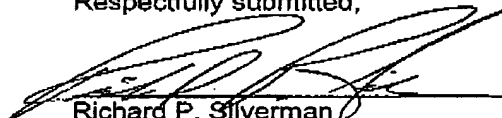
Serial No.: 10/868.005

Art Unit 1714

Response to Office Action Mailed 09/11/2006

An early and favorable action is courteously solicited.

Respectfully submitted,



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Attachments:

Tables A and B
Terminal Disclaimer US Patent 6,652,610
Declaration under 37 C.F.R. 1.132

Attorney's Docket: 2000DE402D
 Serial No.: 10/888,005
 Art Unit: 1714
 Response to Office Action Mailed 09/11/2006

Table A: Tests results in test oil 6

Amphiphile		Cold flow improver, active ingredients						none
		CFI "A" @35 ppm	CFI "A" @20 ppm	CFI "F" @ 35 ppm	CFI "F" @20 ppm	CFI "G" @35 ppm	CFI "G" @20 ppm	
amphiphile 6 @120 ppm	WSD	399	395	386	396	382	402	400
	ADT	13,5	10,2	5,5	5,5	5,6	5,8	5,7
	CFPP	-18	-12	-20	-12	-21	-14	-9
amphiphile 6 @200 ppm	WSD	375	n. d.	358	n. d.	354	n. d.	376
	ADT	13,5	n. d.	6,5	n. d.	6,2	n. d.	6,1
	CFPP	-18	n. d.	-20	n. d.	-20	n. d.	-9
none	WSD	672	676	665	670	668	670	674
	ADT	13,2	9,7	5,6	5,4	5,6	5,4	5,4
	CFPP	-18	-12	-18	-12	-19	-14	-9

n. d. = not determined

Page 11
 Attorney's Docket: 2000DE402D
 Serial No.: 101668.005
 Art Unit 1714

Table B: Tests results in test oil 7

Amphiphile		Cold flow improver, active ingredients					
		CFI _A " @350 ppm	CFI _A " @600 ppm	CFI _F " @350 ppm	CFI _F " @600 ppm	CFI _H " @350 ppm	CFI _H " @600 ppm
amphiphile 1 @100 ppm	WSD	427	432	415	413	408	410
	ADT	32,6	43,5	9,5	10,2	10,0	10,6
	CFPP	-17	-19	-21	-21	-22	-23
amphiphile 1 @50 ppm	WSD	622	n. d.	618	n. d.	612	n. d.
	ADT	36,3	n. d.	10,5	n. d.	9,1	n. d.
	CFPP	-17	n. d.	-19	n. d.	-20	n. d.
none	WSD	706	692	701	677	698	675
	ADT	35,6	41	10,4	12,6	9,3	11,2
	CFPP	-17	-19	-19	-21	-20	-23

n. d. = not determin